CLAIMS

1. In a UPnP-based network system in which UPnP AV devices are located on a home network and a common internet, respectively, a UPnP AV

5   device interworking method of the UPnP-based network system, which allows the UPnP devices to interwork with each other, by transforming a private address to a public address by Uniformed Resource Identifier (URI) address transformation between the UPnP AV devices located on the home network and the common internet, respectively.

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2. The method of claim 1, further comprising a control point (CP) for controlling the UPnP AV devices located on the home network and the common internet, respectively,

    wherein the CP is located on the home network or the common internet.

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3. The method of claim 2, wherein any one of the UPnP AV device, the CP and an internet gateway device (IGD) for connecting the CP and the UPnP AV device performs the URI address transformation.

20   4. The method of claim 3, wherein, in the case of an in-band streaming protocol, the CP performs the URI address transformation, and in the case of an

out-of-band streaming protocol, the UPnP AV device performs the URI address transformation.

5. The method of claim 1, wherein the URI address transformation is
5   transformation of an IP address and a port by Network Address Transform (NAT).

6. The method of claim 1, wherein, when the UPnP AV device located on the home network is a media server (MS), the UPnP AV device located on
10   the common internet is a media renderer (MR), the CP for controlling the MR and the MS is located on the common internet, and an IGD for connecting the CP and the MS is included, the CP performs the address transformation of the URIs included in return values of Browse( ) and Search( ) actions from the MS.

15   7. The method of claim 6, wherein the IGD is an independent gateway device or a personal computer (PC) serving as a gateway.

8. The method of claim 6, wherein the MS, the IGD or the CP performs the address transformation of the URIs included in the return values of the
20   Browse( ) and Search( ) actions.

9.   The method of claim 8, wherein the URI address transformation is

transformation of an IP address and a port by the NAT, which transforms IP

addresses and ports in the whole URIs or the URIs selected by the user

(on-the-fly).

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10.   The method of claim 9, wherein, when the CP and the MS are

connected to each other, the NAT is set up by a UPnP IGD CP included in the

MS.

10   11.   The method of claim 6, further comprising the steps of:

transmitting, at the CP, Browse( ) or Search( ) action to the MS through

the IGD;

transmitting, at the MS, an action return value including a URI to the CP

through the IGD; and

15   playing back, at the MR, the contents under the control of the CP.

12.   The method of claim 1, wherein, when the UPnP AV device located

on the home network is an MS, the UPnP AV device located on the common

internet is an MR, the CP for controlling the MR and the MS is located on the

20   home network, and an IGD for connecting the CP and the MR is included, the

CP transforms a URI address of SetAVTransportURI( ) action to a fixed address,

so that the MR can play back the contents.

13. The method of claim 1, comprising the steps of:

when the UPnP AV device located on the home network is an MR, the

5   UPnP AV device located on the common internet is an MS, the CP for

controlling the MR and the MS is located on the common internet, and an IGD

for connecting the CP and the MR is included,

when the CP and the MR are connected to each other, setting up the

NAT for transforming the private address to the fixed address by a UPnP IGD

10   CP included in the MR;

confirming, at the CP, an address of contents of the MS on the basis of a

description address, and transmitting Browse( ) action to the MS; and

performing, at the MS, contents streaming to the MR by pushing.

15   14. The method of claim 1, wherein, when the UPnP AV device located

on the home network is an MR, the UPnP AV device located on the common

internet is an MS, the CP for controlling the MR and the MS is located on the

home network, and an IGD for connecting the CP and the MS is included, the

CP transforms a URI address of SetAVTransportURI( ) action called from the

20   MS.

15. The method of claim 14, further comprising the steps of:

setting up the NAT for transforming the private address to the fixed

address by a UPnP IGD CP included in the MR when the CP and the MR are

connected to each other;

5   confirming, at the CP, an address of contents on the basis of description

information, and transmitting SetAVTransportURI( ) action for selecting playback

contents to the MS through the IGD; and

performing, at the MS, contents streaming to the MR by pushing.

10   16.   In a UPnP-based network system in which UPnP AV devices are

located on a home network and a common internet, respectively, a UPnP AV

device interworking method of the UPnP-based network system, comprising the

steps of:

obtaining, at a CP controlling the UPnP AV devices, a URI of contents

15   located on the home network;

transforming, at the CP, a private address of the URI to a public address;

and

receiving and playing back, at the UPnP AV device located on the

common internet, predetermined contents by streaming on the basis of the

20   transformed address.

17.   The method of claim 1, wherein the URI address transformation transforms an IP address and a port number of the URI into a public address.

18.   In a UPnP-based network system in which UPnP AV devices are
5   located on a home network and a common internet, respectively, a UPnP AV device interworking method of the UPnP-based network system, comprising the steps of:

obtaining an address of the UPnP AV device located on the home network;

10   confirming the UPnP AV device located on the common internet by referring to description information;

notifying the address of the UPnP AV device located on the home network to the UPnP AV device located on the common internet; and

playing back contents selected by the user, by transmitting the contents
15   from the UPnP AV device located on the common internet to the UPnP AV device located on the home network by pushing.

19.   The method of claim 18, wherein the address transformation is transformation of an IP address and a port by the NAT, which is performed by
20   any one of the UPnP AV device, an IGD and the CP.

20.   The method of claim 19, wherein, in the case of an in-band streaming protocol, the CP performs the address transformation, and in the case of an out-of-band streaming protocol, the UPnP AV device performs the address transformation.